

Application No.: 10/700003
Docket No.: CL1646USDIV

Page 5

REMARKS

Claims 23-29 and 36 are in the case. All claims stand rejected variously under 35 USC § 112 and the judicially created doctrine of double patenting.

Claims 23 and 27 have been amended to more clearly define applicants invention
No new matter has been added.

Information Disclosure Statement

Entries that are lined through on PTO form 1449 fail to comply with 37 CFR 1.97 in that the Genbank references are not identified by author, title or page numbers and thus the information contained in these references has not been considered. An amended PTO 1449 is enclosed herewith.

Drawings

Applicants take note that the drawings are being used by the examiner for examination purposes only.

Specification

The Examiner notes that the specification has not been amended to update the relationship of the instant application to the parent. The specification has been so amended.

Biological Deposit

Applicants note that the statement of biological deposit filed on 11-3-2003 has been received by the office.

Claim Objections

Claim 25 is objected to under 37 CFR 1.75 (c) as being in improper dependent form and failing to limit the scope of claim 23 from which it ultimately depends. Specifically the Examiner suggests that claim 23 is drawn to a method of using a polynucleotide encoding a pyrophosphate dependant phosphofructokinase of SEQ ID NO:4, and that claim 25 recites a general limitation of any pyrophosphate dependant phosphofructokinase. Applicants disagree. Claim 23 does not identify SEQ ID NO:4 as a pyrophosphate dependant phosphofructokinase. In fact this sequence is the deduced amino acid sequence of *dxr* encoded by ORF 2 (see page 6, line 5 of the specification). Thus, Applicants submit that Claim 25 is narrowing of Claim 23 and no amendment is needed.

Claim 27 is objected to for informalities. Specifically, "form" should be corrected to "from" in line 2. The claim has been so amended.

Claim Rejections – 35 USC § 112 2d paragraph

Application No.: 10/700003
Docket No.: CL1646USDIV

Page 6

Claim 25 and 26 are rejected under 35 USC § 112, 2d paragraph for indefiniteness. Specifically, claim 25 recites the word "gene" and the metes and bounds of the usage of this term are not clear. The examiner has suggested replacing the term with polynucleotide because the specification lacks support for the term "gene". Applicants respectfully traverse. The term gene is used throughout the application and is defined in detail on page 15, beginning at line 29. Applicants submit no amendment is needed.

Claim Rejections – 35 USC § 112 1st paragraph

Claims 25-26 are rejected under 35 USC § 112, 1st paragraph for failing to comply with the written description requirement. The examiner argues that because claim 25 recites the limitation of any pyrophosphate dependant phosphofructokinase whereas only a few examples are given in the specification, (SEQ ID No's: 2, 4, 6, 8, 10, 12, 14, 16, 18 and 24) that the person of skill in the art would not understand that the applicants were in possession of the invention.

Applicants note that SEQ ID No's: 2, 4, 6, 8, 10, 12, 14, 16, 18 and 24 all encode different upper pathway isoprenoid enzymes, none of which is a pyrophosphate dependant phosphofructokinase. Thus the examiner's rationale for this rejection appears to be based on a misunderstanding of the facts presented in the specification. Clarification is requested. The foregoing notwithstanding, Applicants submit that the limitation of the presence of a gene encoding a pyrophosphate dependant phosphofructokinase as part of a broader Embden-Meyerof carbon pathway is fully described in the specification (see page 5 beginning at line 33; page 28, and line 20). Applicants submit that the specification adequately describes all the limitations of the claims.

Claims 25-26 are rejected under 35 USC § 112, 1st paragraph for lack of enablement. Applicants traverse.

The examiner again appears to have misunderstood the relationship between SEQ ID NO:4 and the pyrophosphate dependant phosphofructokinase of Claim 25 and argues that the claims are enabled for methods of isoprenoid production using SEQ ID NO:4 but not for all pyrophosphate dependant phosphofructokinases. As noted above SEQ ID NO:4 does not encode a pyrophosphate dependant phosphofructokinase. Clarification is again requested.

Applicants note that the examiner finds that claim 25 is enabled with respect to SEQ ID NO:4 and applicants would agree. Claim 26 merely further narrows the claim to insist that the host cell now comprise an Embden-Meyerof carbon pathway comprising a gene encoding a pyrophosphate dependant phosphofructokinase. Since these limitations are further limiting of Claim 25 Applicants submit that the examiner's rationale would support the notion that the claims are enabled.

Application No.: 10/700003
Docket No.: CL1646USDIV

Page 7

Claims 23-28 and 36 are rejected under 35 USC § 112, 1st paragraph for lack of enablement. The examiner argues that the claims are not enabled for the production of all isoprenoid compounds.

Applicants have amended the claims to recite the production of β -carotene and astaxanthin. Basis for this amendment may be found on page 7 line 31 of the specification.

Claim 27 is rejected under 35 USC § 112, 1st paragraph for lack of enablement. The examiner suggests that the large number of plants recited in the claim are not supported by adequate teaching in the specification. Applicants traverse.

Page 35 beginning at line 28 gives a detailed description of methods and materials needed for the transformation of a wide variety of plant species. The specific plants recited in the claims are supported in this section of the specification. Applicants submit that the person of skill in the art, given the teaching of the specific genes of the invention, would be able to make and use the invention given the disclosure of page 35. The examiner states that Applicants have not provided sufficient guidance to the skilled person to make and use the invention in plants. Applicants respectfully request that the examiner specifically point out what aspect of the disclosure is deficient in teaching the skilled person how to use the present genes in plants to make the claimed product.

Double Patenting

Claims 23-29 and 36 are provisionally rejected under the judicially created doctrine of non-obviousness double patenting, over claims 1, 3, 7, 12, 13, 38-40 and 48-50 of co-pending application USSN 09/941,947. The examiner alleges that the two sets of claims are not patentably distinct. A terminal disclaimer is sufficient to overcome the present rejection.

While not intending to agree with the examiner's rationale, Applicants file herewith a Terminal Disclaimer disclaiming the terminal part of any statutory term of any patent granting on the instant application that extends beyond the term of USSN 09/941,947.

In view of the foregoing arguments and amendments to the claims Applicants respectfully request reconsideration of the claims as amended and removal of all rejections.

Respectfully submitted,



S. NEIL FELTHAM
ATTORNEY FOR APPLICANTS

Application No.: 10/700003
Docket No.: CL1646USDIV

Page 8

Registration No.: 36,506
Telephone: (302) 992-6460
Facsimile: (302) 992-5374

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